Remarks

Specification

The Examiner objected to the specification because the application serial numbers and filing dates of the cross-referenced patent applications were missing. Applicant has amended the specification to list the missing application serial numbers and filing dates.

Claim Rejections

Claims 1 to 14 were pending when last examined. With this Response, Applicant amends claims 1, 5, 7, and 9 to 14, cancels claims 2 to 4, 6, and 8, and adds claims 15 to 21.

§ 102 Rejection

The Examiner rejected claims 1, 2, 5, 6, 8, 10, 11, 13, and 14 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,809,542 ("Byers et al.").

Applicant has amended independent claims 1 to be patentable over the cited references. Claim 1 now recites:

> 1. A hard disk drive enclosure, comprising:
>
> a first group of current sharing power supplies implementing a first power domain;
>
> a first plurality of elements in the first power domain powered by the first group of current sharing power supplies, wherein the first plurality of elements includes a first plurality of hard disk drives;
>
> a second group of current sharing power supplies implementing a second power domain; and
>
> a second plurality of elements in the second power domain powered by the second group of current sharing power supplies, wherein the second plurality of elements includes a second plurality of hard disk drives.

Claim 1 (emphasis added).

Byers et al. does not disclose a hard disk drive enclosure with (1) a first group of hard disk drives in a first power domain, and (2) a second group of hard disk drives in a second power domain. Instead, Byers et al. discloses an "outboard file cache extended processing complex for providing

closely coupled file caching capability" for a host such as a Unisys 2200/900 series server. Byers et al., Abstract. The outboard file cache extended processing complex 102, as illustrated in Fig. 6 of Byers et al., uses a non-volatile storage 220 consisting of dynamic random access memory (DRAM), and not hard disk drives, to cache files for the host.

> Non-Volatile Storage (NVS) section 220 includes multiple DRAM storage modules and provides the file cache memory. Half of the storage modules are within Power Domain A and the other half are within Power Domain B. The data stored within the storage modules in Power Domain B reflects the data stored in storage modules within Power Domain A. NVS 220 thereby provides for redundant storage of cached file data and the control structures used by the outboard file cache XPC 102.

Byers et al., col. 16, lines 15 to 26 (emphasis added). Thus, claim 1 is patentable because Byers et al. does not disclose or suggest a hard disk drive enclosure with (1) a first group of hard disk drives in a first power domain, and (2) a second group of hard disk drives in a second power domain.

Applicant has canceled claim 2, thereby rendering its rejection moot.

Claim 5 depends from claim 1 and is patentable over Byers et al. for at least the same reason as claim 1. Applicant has also amended claim 5 to be further patentable over Byers et al. Claim 5 now recites:

> 5. The hard disk drive enclosure of claim 1, further comprising:
>
> a third plurality of elements in a shared power domain;
>
> a power circuit coupled to the first group of current sharing power supplies and the second group of current sharing power supplies to provide a shared power to the third plurality of elements.

Claim 5 (emphasis added).

Byer et al. does not disclose a redundant power scheme with (1) a first plurality of elements (e.g., disk drives) in a first power domain powered by a first group of current sharing power supplies, (2) a second plurality of elements (e.g., disk drives) in a second power domain powered by a second group of current sharing power supplies, and (3) a third plurality of elements (e.g., a backplane with a port bypass circuit as disclosed in new dependent claims 16 and 17) in a shared power domain powered by a circuit coupled to the first group and the second group of power supplies, as recited in claim 5 and shown in Fig. 5 of the present disclosure. As explained in the specification, such a

redundant power scheme provides power to the third plurality of elements in the shared power domain even if just one of the power supplies in the first and the second groups remains operational.

> FIG. 5 is a schematic diagram, in partial block form, of voltage circuit 402 used to generate Vshared-A, according to an embodiment of the present invention. Voltage circuit 402 generates a diode ORed and fused voltage derived from power domains A and B. A voltage A from current shared power supplies A0 and A1 is fed via a fuse 502 to a diode 504, and a voltage B from current shared power supplies B0 and B1 is fed via a fuse 503 to a diode 505. Diodes 504 and 505 are coupled to supply voltage Vshared-A to loop A elements on FC-AL board 104 and midplane board 106. Thus, voltage Vshared-A will be maintained if either voltage A or B is supplied. Accordingly, loop A elements on FC-AL board 104 and midplane board 106 remain accessible (operational) if any one of the power supplies A0, A1, B0, and B1 is present (operational). Voltage circuit B is implemented in the same or similar fashion to supply voltage Vshared-B to loop B elements on FC-AL board 104 and midplane board 106.

Specification, p. 13, line 22 to p. 14, line 4 (emphasis added).

On the other hand, Byer et al. discloses (1) a first domain (i.e., Power Domain A) powered by a first group (i.e., DC power source A 1018) of current sharing power supplies (i.e., Power Supply A1 1082 and Power Supply A2 1084), (2) a second domain (i.e., Power Domain B) powered by a second group (i.e., DC power source B 1020) of current sharing power supplies (i.e., Power Supply B1 1086 and Power Supply B2 1088), but not (3) a shared power domain powered by a power circuit coupled to the first group and the second group of current sharing power supplies.

> If either power supply fails within DC Power Source A or DC Power Source B, the remaining power supply can supply enough current to keep the circuitry of the power domain operative. When both power supplies are operative, the power supplies share current, and both provide current to the power domain.

Byer et al., col. 42, line 63 to col. 43, line 1. Thus, Byer et al. does not disclose "a third plurality of elements in a shared power domain; and a power circuit coupled to the first group of current sharing power supplies and the second group of current sharing power supplies to provide a shared power to the third plurality of elements," as recited in claim 5.

Understandably, the Examiner may have mistakenly believed that Byer et al. discloses the redundant power scheme of claim 5 because Fig. 34 shows that AC Power Source A 1026 and AC Power Source B 1028 are each coupled to one of the DC Power Supplies in each DC Power Source. Byer et al. explains this configuration guards against a failure of one of the AC Power Sources. "In this way, a failed AC power source will only affect one power supply in each DC power source, and

the other power supply in each DC power source will remain operational." Byer et al., col. 43, lines 12 to 15. However, these AC Power Sources are not the claimed power supplies in hard disk enclosures.

> The AC Power Source used in the preferred embodiment consists of using either utility AC power or diesel generator power, one of which will be selected through the use of an uninterruptible power source. However, it must be appreciated that any other type of AC power source would serve as ell, such as motor/alternator AC power sources and the like.

Byer et al., col. 43, lines 25 to 31 (emphasis added). Byer et al. thus discloses a redundancy scheme for the external AC power source, such as utility AC power or diesel generator power, but not (1) a first power domain, (2) a second power domain, and (3) a shared power domain as recited in claim 5.

Even in combination with U.S. Patent No. 3,949,238 ("Brookes"), Byer et al. and Brookes do not disclose a redundant power scheme with a first power domain, a second power domain, and a shared power domain. As shown in Fig. 1, Brookes simply discloses current sharing power supplies A and B. Thus, Byer et al. and Brookes, either alone or in combination, do not disclose or suggest a redundant power scheme with a first power domain, a second power domain, and a shared power domain as recited in claim 5.

Claims 6 and 8 have been canceled, thereby rendering their rejections moot.

Applicant has amended claim 10 to be patentable over the cited references for at least the same reasons as discussed above for claim 1.

Claims 11, 13, and 14 depend from claim 10 and are patentable for at leas the same reasons that claim 10 is patentable.

§ 103 Rejection

The Examiner rejected claims 3, 4, 7, 9, and 12 under 35 U.S.C. § 103(a) as being unpatentable over Byers et al. in view of either U.S. Patent No. 6,260,079 ("White") or Brookes.

Applicant has canceled claims 3 and 4, thereby rendering moot their rejections.

Claims 7 and 9 depend from claim 1 and are patentable over Byers et al. in view of White and the official notice, respectively, for at least the same reason as claim 1.

Claim 12 depend from claim 10 and is patentable over Byers et al. in view of Brookes for at least the same reason that claim 10 is patentable.

New Claims

Applicant has added new claims 15 to 21, which depend from claim 1 and are patentable over the cited references for at least the same reason as claim 1.

In summary, claims 1 to 14 were pending in the above-identified application when last examined. This Response amends claims 1, 5, 7, and 9 to 14, cancels claims 2 to 4, 6, and 8, and adds claims 15 to 21. For the above reasons, Applicant respectfully requests allowance of claims 1, 5, 7, and 9 to 21. Should the Examiner have any questions, please call the undersigned at (408) 382-0480.

Certification of Facsimile Transmission

I hereby certify that this paper is being facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

Signature Date Sept 9, 2003

Respectfully submitted,

David C. Hsia
Attorney for Applicant(s)
Reg. No. 46,235

RECEIVED
CENTRAL FAX CENTER
SEP 10 2003

OFFICIAL